

Work Order ID 138714

138714

Page 1

Tuesday, November 10, 2015 11:22:44 AM

Item ID: D350-748-103

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: MJS

Date: NOV 10 2015

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D350-748-143	A

100

Document Control

0.00

DAS
6
9-83

100

DC

DOCUMENT CONTROL

0.00

Memo

Doc.Control -USB or Paperwork

Photocopy bluefile & type labels per PPPD350-748-103

CHG001

MJS 15-01-26

110

BENDING MACHINE - CROSSTUBES

0.00

110

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend tube as per Dwg D350-748-143 using CNC bender program D350F and Folio FT

TW 15-11-12

SEE
Attached

~~UNDER BEND .225" PER SIDE****~~

~~USE (4) DT9824 SHIM BLOC TO CHECK STRAIGHTNESS****~~

D350-748-103/138714

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Revision ID:

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Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

120

120

Crosstubes

Crosstubes

Memo

****VERIFY CROSSTUBE DIMENSIONS AS PER DWG****

127

127

QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Memo

MARK CUT LINES

0.00

128

128

Crosstubes

Crosstubes

Memo

CUT TUBE AT HEIGHT ON FAI SHEET

0.00

0.00

VERF HEIGHT 23.25 BY QC 15 LEVEL INSPECTOR man1VERF TWIST 0.080 BY QC15 LEVEL INSPECTOR man1

1 Ø 15/11/17
DAS
49
9-89

BL 15/11/17

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Item ID: D350-748-103

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N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	Crosstubes	0.00							
130									
Crosstubes	Memo	0.00				BC		15/11/17	
Crosstubes									
	2- Drill Tube as per Dwg D350-748-143 Using DT8876 A,B & C Drill Jigs, Set-up drill table as per QSI 010								
	3- Deburr								
	4- Engrave Part # and Batch # as per Dwg D350-748-143								
	5- Remove all marks from tube within limits of D350-748-143								15-11-17
	6- Apply a light coat of LPS3 on the interior of tube Batch: _____								
140	QC5- Inspect part completeness to step on W/O	0.00							
140									
QC	Memo	0.00							
Quality Control	CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

DAS
9
9-89

① 15-11-20

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Item ID: D350-748-103

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Stop ***NS2***

Start Date: 11/10/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
174	Outsource process - NDT per QSI038 4.1	0.00							
174									
Outsource2	Memo	0.00							
Outsource process - NDT	ISSUE P/O TO ACUREN: <u>30533</u>								
176	Receive & Inspect for Damage & Mat'l Certs	0.00							
176									
Packaging	Memo	0.00							
Packaging									
178	QC5- Inspect part completeness to step on W/O	0.00							
178									
QC	Memo	0.00							
Quality Control									

CZ NOV 23 2015 /

1X 805-11-23

1 EB
15-11-30

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Item ID: D350-748-103

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N900040100

Setup Start

NS1

Revision ID:

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NS2

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Start Date: 11/10/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool # Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

0.00

180

SprayPaint

SprayPaint

Memo

0.00

1. Apply Axalta 13205S Cleaner inside and outside crosstube per QSI 005 4.1.4

BATCH: 132520

2. Axalta 230S Metalok inside and outside crosstube per QSI 005 4.1.4

BATCH: 132474

3. Prime inside and outside crosstube per QSI 005 4.2

BATCH: 133084

4. Paint outside of crosstube per QSI 005 4.2

BATCH: 133325

15-11-24

190

QC14- Inspect Spray Paint

0.00

190

QC

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

Quality Control

15-11-30

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Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run

Start

NR1

QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

0.00

200

Crosstubes

0.00

Crosstubes

Memo

INSTALL GROUND WIRE INSERT, THEN INSERT SCREW AND WASHER

1-Abraze mating surfaces of support and crosstube with 180 grit sandpaper,
clean the area with MEK or equivalent as per dwg

2-Install supports with Proseal 890 per D350-748-143 and QSI 015

A/R Proseal 890 Batch: 133071
EXP: 2/163-Install supports clamps Using Dt8876 as per Dwg D350-748-141, Torque to
60-80 IN-LBS.

PROSEAL CURE TIME 72 HOURS:

Start: 15-11-25Finish: 15-11-28***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED
FOR 72HOURS AS PER DWG.***

DAS

41

9-89

15-11-25

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Item ID: D350-748-103

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N900040100Setup Start ***NS1***

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Start Date: 11/10/2015 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

QC5- Inspect part completeness to step on W/O

0.00

210

QC

Memo

0.00

Quality Control

***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED
FOR 72HOURS AS PER DWG.***

1
15-11-30

220

Pick Kit

0.00

220

Packaging

Memo

0.00

Packaging

DAS
8
9-89

NOV 26 2015

DAS
28
9-89

230

QC4- 100% Inspect kits for completeness

0.00

230

QC

Memo

0.00

Quality Control

DAS
27
9-89
JAN 18 2016

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N900040100Setup Start ***NS1***

Revision ID:

Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Stop ***NS2***

Start Date: 11/10/2015 Start Qty: 1.00

1

Cust Item ID:

Required Date: 11/10/2015 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start ***NR1***
Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240	Packaging	0.00							
240									
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-103								
	Location: _____								
	PPP Rev: _____								
250	QC21- Final Inspection - Work Order Release	0.00							
250									
QC	Memo	0.00							
Quality Control									

MLJ

JAN 18 2016

MLJ

JAN 18 2016

Picklist Print

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Page 1

Work Order ID: 138714

138714

Parent Item: D350-748-103

D350-748-103

Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP REV:A 15.03.23 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D350-748-143TRN

Manufactured

No

Each

8.0000

1

D350-748-143TRN

SS Crosstube Turning Detail

Location

Loc Qty

Loc Code

LG003

8

135154

1

135156

1

135157

1

135158

1

135159

1

135160

1

135161

1

135162

1

D3502-1

Manufactured

No

Each

28.0000

2

D3502-1

Support

Location

Loc Qty

Loc Code

LG052

28

130349

28

Each

74.0000

2

D5123-7

Manufactured

No

D5123-7

Clamp Cushion

Location

Loc Qty

Loc Code

LG052

74

131194

16

133492

12

136671

26

137766

20

2

DAS
41
9-89

15-11-26

DAS
41
9-89

15-11-26

① JW 15-11-12

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Work Order ID: 138714

138714

Parent Item: D350-748-103

D350-748-103

Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

AETC-1032

Purchased

No

Each

20.0000

1

DAS
41
9-89

15-11-26

AETC-1032

Insert

**

Location

Loc Qty

Loc Code

ST547

20

m133002

20

Each

1,061.000

1

DAS
41
9-89

15-11-26

NAS1149C0363R

Purchased

No

NAS1149C0363R

Washer

**

Location

Loc Qty

Loc Code

FP001

24

114742

24

GA

506

m133077

506

ST260a

494

m133077

494

ST271

37

m132763

37

Each

157.0000

2

DAS
41
9-89

15-11-26

MS21920-20

Purchased

No

MS21920-20

Clamp

**

Location

Loc Qty

Loc Code

FG

2

122254

2

LG050

25

m133483

25

LG056

130

m128650

13

m132675

67

m133134

50

2

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Shop Packet Print

Page 2

Picklist Print

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Work Order ID: 138714

138714

Parent Item: D350-748-103

D350-748-103

Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

MS51958-63

Purchased No

Each

41.0000

1

DAS

MS51958-63

Screw

**

41

9-89

15-11-26

Location

Loc Qty

Loc Code

ST273

41

m131886

41

1

AN4-6A

Purchased No

220

Each

534.0000

16

16

AN4-6A

BOLT

**

DAS
28
9-89

Location

Loc Qty

Loc Code

CA

143

M128403

43

M130851

100

ST325A

100

M133363

100

ST345

291

M128403

8

M133316

283

16

D3500-1

Manufactured No

220

Each

11.0000

4

4

D3500-1

Saddle

**

138953

JAN 14 2016

Location

Loc Qty

Loc Code

ST406

11

129373

10

131168

1

DAS
27
9-89

DAS
28
9-89

NOV 20 2015
DAS
28
9-89

Picklist Print

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Work Order ID: 138714

138714

Parent Item: D350-748-103

D350-748-103

Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

AN5-32A

Purchased

No

220

Each

219.0000

4

4

AN5-32A

Bolt

DAS
27
9-89

Location

Loc Qty

Loc Code

ST299A

180

m132857

30

m133323

150

ST336

32

m132536

32

ST337

7

m131139

7

NAS1149D0463J

Purchased

No

220

Each

4,854.000

32

32

NAS1149D0463J

WASHER

DAS
27
9-89

Location

Loc Qty

Loc Code

GA

626

M129390

41

M132035

585

ST260a

2786

M133284

1286

M133316

1500

ST269

1442

M129682

47

M130799

371

M132317

101

M132677

888

M133077

35

DAS
6

9-89

DAS
28
9-89

DAS
6

9-89

DAS
28
9-89

NOV 26 2015

Picklist Print

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Work Order ID: 138714

138714

Parent Item: D350-748-103

D350-748-103

Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

D3501-1

Manufactured No

220

Each

419.0000

16

16

D3501-1

Bushing

DAS
6
9-89

DAS
28
9-89

Location

Loc Qty

Loc Code

ST039

112

130742

14

135919

98

ST046

1

125925

1

ST051A

306

135918

306

16

AN4-41A

Purchased

No

220

Each

287.0000

8

8

AN4-41A

Bolt

DAS
6
9-89

DAS
28
9-89

Location

Loc Qty

Loc Code

ST312A

238

m130726

8

m132189

130

m133483

100

ST342

49

m130716

49

8

NOV 26 2015

DAS
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Shop Packet Print

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Picklist Print

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Parent Item: D350-748-103

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Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

220

Each

465.0000

4

4

MS21042L5

Nut

Location

Loc Qty

Loc Code

GA

146

m127813

146

ST303

71

m132677

71

ST304

200

m133363

200

ST305

48

m127813

19

m131340

21

m132123

8

DAS
27
9-89

DAS
6
9-89

NOV 26 2015

DAS
28
9-89

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Parent Item Name: AS350 / AS355 Stainless Steel Fwd Crosstube

Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

MS21042L4

Purchased

No

220

Each

1,994.000

24

24

MS21042L 4

Locknut

**BAS
27
9-89**

Location

Loc Qty

Loc Code

FP001

2

m124231

2

GA

67

m127813

67

ST260a

138

m130799

56

m131803

6

m132262

76

ST303

1618

m133363

1618

ST305

169

m128300

8

m130388

7

m130922

97

m132123

56

m133316

1

24

NOV 26 2015
DAS
28
9-89
DAS
6
9-89

Picklist Print

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Start Date: 11/10/2015

Required Date: 11/10/2015

Start Qty: 1.00

Required Qty: 1.00

NAS1149D0563J

Purchased

No

220

Each

1,227.000

8

8

NAS1149D0563.I

Washer

Location

Loc Qty

Loc Code

GA	53
m125807	53
ST260a	928
m130799	63
m132035	55
m132256	10
m133134	300
<u>m133363</u>	500
ST269	227
m128257	156
m132677	71
ST271	19
m131026	19

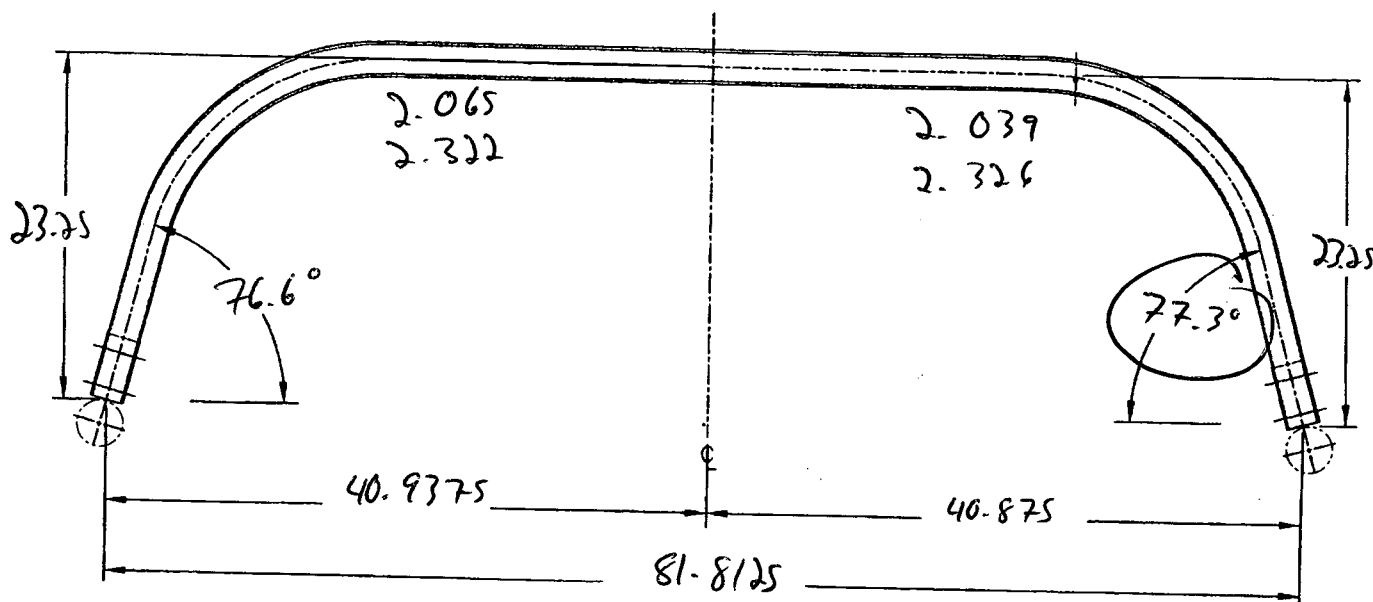
DAS
6
9-89

NOV 26 2015
DAS
28
9-89

BAS
27
9-89

DART AEROSPACE LTD		Work Order: 138714
Description: Crosstube High Fwd, SS (AS350/355)		Part Number: D350-748-103
Inspection Dwg: D350-748-143	Rev: A	Page 1 of 1

Required Dimension	Min	Max
Height	23.00	23.50
1/2 Span	40.77	41.03
Angle	75	77
Total Span	81.55	82.05
Bending Passes	7	--
Crushing	--	8%
Twist	--	0.38



	Side A	Side B
Bending Passes	31	33
Crushing	5.8%	6.5%
Comments		
Max L		

QC15 Inspection	DAS
Date	49
15/11/17	9-89

Rev	Date	Change	Revised by	Approved
A	15.09.09	New Issue	KJ	AA

Item	Qty	Part Number	Description
	143		
	X	D350-748-143	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
1	1	D6021-125	CROSSTUBE
2	2	D3502-1	SUPPORT
3	2	D5123-7	CLAMP CUSHION
4	1	AETC-1032	INSERT
5	2	MS21920-20 OR MS21920-21/-22	CLAMP (PER DART SPEC. M-MS21920-20/-21/-22)
6	1	NAS1149C0363R	WASHER (OR AN960C10)
7	1	NAS1635-3-8	SCREW (OR MS51958-63)
8	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6021-125 (17-4PH)
FINISHED LENGTH AFTER TURNING = 112.270±0.06 (AFTER BENDING/TRIMMING = 110.27 REF)
- 2) FINISH: PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCE: PER DART QSI 018 UNLESS OTHERWISE NOTED.
WALL THICKNESS ECCENTRICITY PER DART QSI 038 7.2
MIN. ALLOWABLE WALL IS -0.020 FROM NOMINAL
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART PART NUMBER "D350-748-143" AND BATCH NUMBER ON INSIDE OF CUFF
PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.290 HOLE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.

TURNING

- 10) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH. NOTE: ALL HOLES ARE DRILLED AFTER BENDING.

BENDING

- 11) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES PER SIDE. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D. ON TOP HALF OF BEND, AND 8% ON BOTTOM HALF OF BEND.
- 12) MAX AMPLITUDE OF RIPPING ALONG BENT PORTION OF THE TUBE IS 0.030 (ZN A1-3)
- 13) MAX TWIST: WITH XTUBE LAYED FLAT ON SURFACE, THE DIFFERENCE BETWEEN CUFF HEIGHTS FROM THE SURFACE MAY BE NO LARGER THAN 0.38 (ZN C1-3).

ASSEMBLY

- 14) TO INSTALL D3502-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.02" TO 0.05" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

SECRETARY
TO THE
DIRECTOR
UNCONTROLLED COPY
SUBJECT TO
WITHIN
WORKING
NO. 138714 MJS
1571-10

UNDER REVIEW

15/4/26
URF 15-561

RELEASED

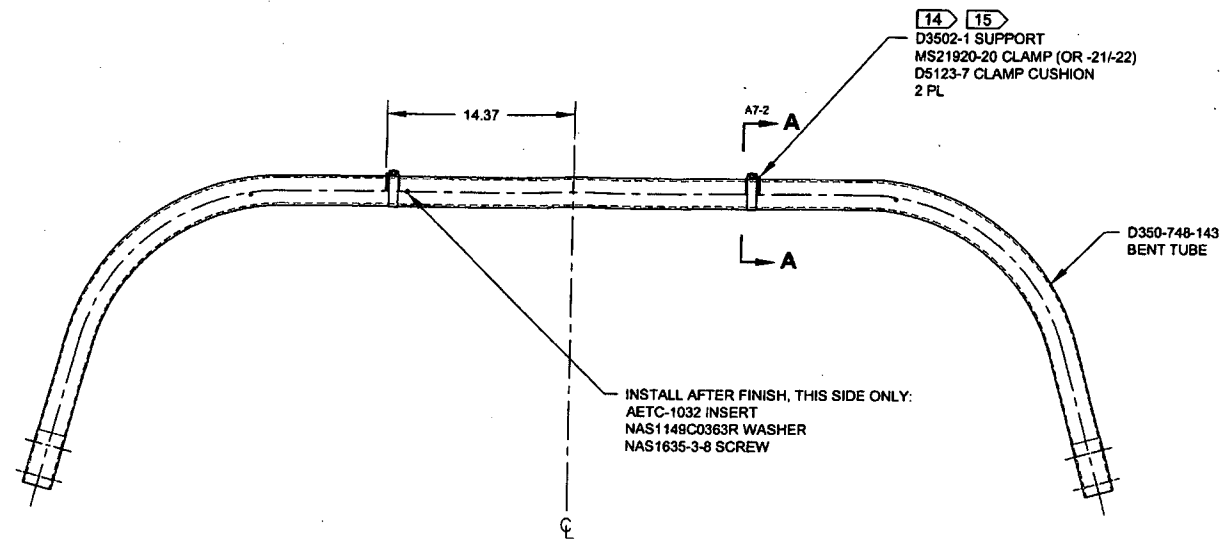
2015 MAR 18

9 EN 15-547

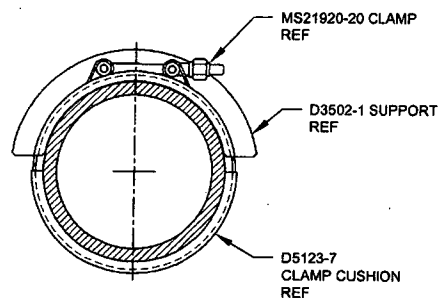
A	NEW ISSUE	CP	15.01.21
REV.	DESCRIPTION	BY	DATE
DESIGN	9P		
DRAWN	9P		
CHECKED	A.P.		
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	15.01.21		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D350-748-143	REV. A SHEET 1 OF 4
TITLE CROSSTUBE (AS 350/355 HI FWD)	SCALE NTS

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**D350-748-143
ASSEMBLY DETAIL**



SECTION A-A D4-2
SCALE 6X

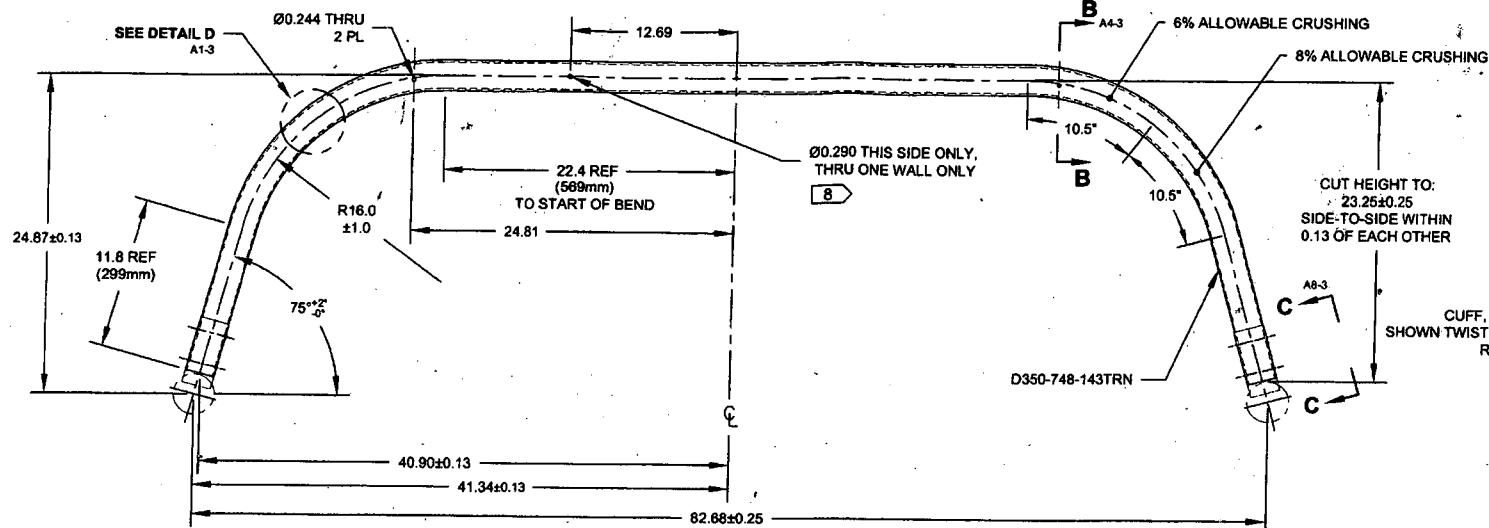
UNDER REVIEW

9/15/14/23

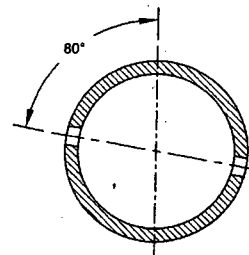
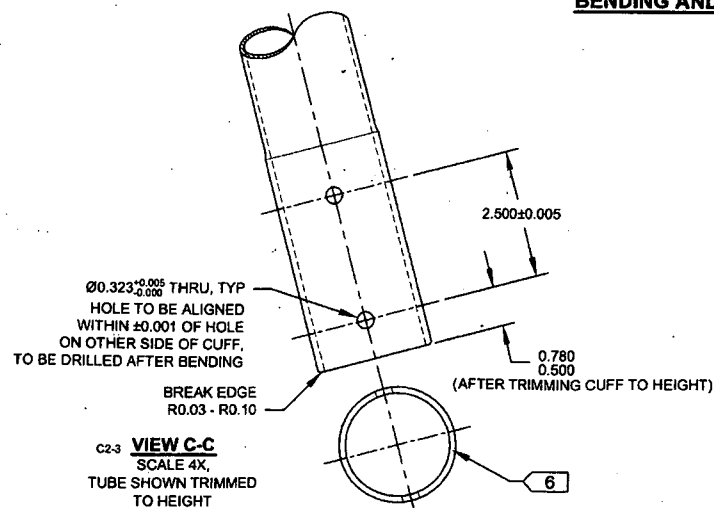
RELEASED

2015 MAR 18
92 EGN-15-547

DESIGN	92	DART AEROSPACE LTD	
DRAWN	92	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REV. A
MFG. APPR.	[Signature]	D350-748-143	SHEET 2 OF 4
APPROVED	[Signature]	TITLE	SCALE
DE APPR.	[Signature]	CROSSTUBE (AS 350/355 HI FWD)	NTS
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D350-748-143
BENDING AND DRILLING DETAIL 11



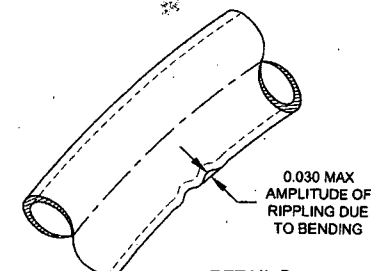
SECTION B-B D3-3
SCALE 6X

RELEASED

2015 MAR 18

UNDER REVIEW

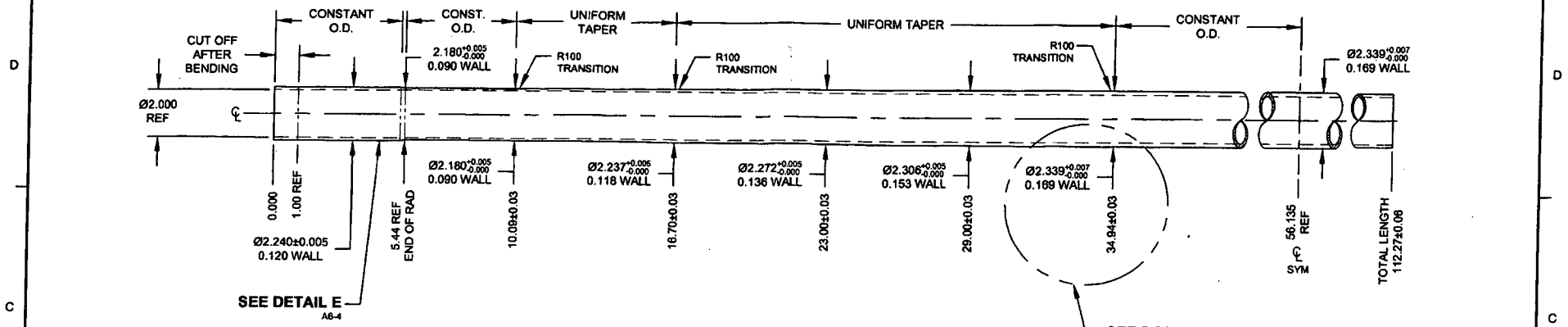
15/14/28



DETAIL D D7-3
SCALE 4X
RIPPLING EXAGGERATED

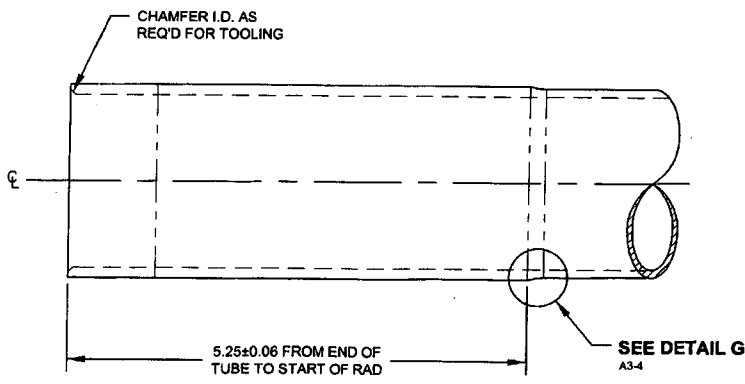
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DRAWN	92	HAWKESBURY, ONTARIO, CANADA	
CHECKED	A.P.	DRAWING NO.	REV. A
MFG. APPR.		D350-748-143	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
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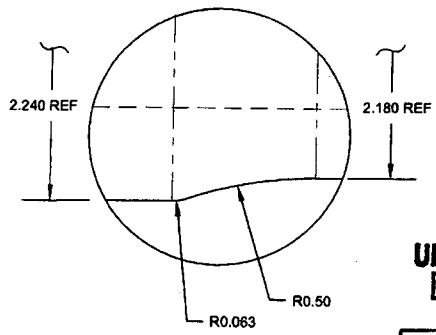


**D350-748-143TRN
TURNING DETAIL**

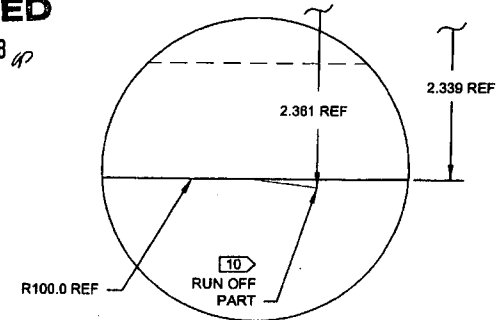
RELEASED
2015 MAR 18



**DETAIL E:
CROSSTUBE CUFF** C7-4
SCALE 3X



**DETAIL G:
CUFF TRANSITION** A5-4
NOT TO SCALE



**DETAIL F:
TOOL RUN-OFF** C3-4
NOT TO SCALE

UNDER REVIEW
15/4/28

DESIGN	40	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	40		
CHECKED	A.P.	DRAWING NO.	REV. A
MFG. APPR.		D350-748-143	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	15.01.21	COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

DQA:

Date:

14/07/02



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed:

Date:

16/02/02

Work Order update only

Work Order: <u>138714</u>		DISPOSITION		AGAINST DEPARTMENT/PROCESS							
Part No. <u>D350-748-103</u>		Rework ☐		Skid-tube ☐		Cross tube ☒		Water Jet ☐		Engineering ☐	
NCR No. <u>16-5558</u>		Scrap ☐		Machining ☐		Small Fab ☐		Prod. Eng. Coord. ☐		Quality ☐	
		Use-as-is ☒		Thermoforming ☐		Finishing ☐		Rec/Store/Packaging ☐		Other ☐	
		Suspected Unapproved ☐		Large Fab ☐		Composite ☐		Supplier ☐			
Date: <u>15/11/16</u>		Step #: <u>110</u>		QTY Effective: <u>1</u>				MRB (QS1042) Approval			
Description Work Order Deviation				Disposition				DAS <u>12</u> <u>15/11/16</u> 9.80			
Angle after bending is 0.3° over tolerance.				Acceptable.				Completed By			
								INSP <u>12</u> <u>15/11/16</u>			
								Lead hand / Supervisor Approval Verification			
								15-11-17			
QC / QA Coordinator Approval 15-11-17 NOV 17 2015											
Root Cause				FAULT CATEGORY							
Environment ☐ No Re-verification ☐ Design ☐ Operator ☐ Doc/Data ☐ Offset/Setup ☐ Equip/Tooling ☐ Supplier ☐ Handling/Pre ☐ Training ☐ Material ☒ Use for Testing ☐ Internal Transport ☐ Poor Information ☐ Tribal Knowledge ☐ Rushing ☐ LOA ☐ Product Improvement ☐ Substation ☐ Process Improvement ☐ Past Expiry Date ☐ Manufacturing Process ☐ Misidentified ☐ Past Due ☐				Pressure/Forced ☐ Temperature/Cure ☐ Power Loss/Surge ☐ Positioned Wrong ☐ Bending ☐ Set-up ☐ Folio/Program ☐ Outside Dimensions ☐ Centre Not Concentric ☐ BOM/Route ☐ Grain ☐ Over/Under tolerance ☒ Cracks ☐ Broken/Damage/Defect ☐ Weld ☐ Part Incorrect ☐ Crimp/Kink/Ripple/Wave ☐ Inspection Incomplete/Unqualified ☐ Wrong Stock Pulled ☐ Part Lost/Missing ☐ Cuffs ☐ Contamination ☐ Out of Sequence ☐ Part Moved ☐ Crushing ☐ Countersink ☐ Off-set ☐ Drawing ☐ Heat Treat ☐ Cut Too Short ☐ Misabeled ☐ Finish ☐ Wave/Twist in Tube ☐ Instructions Incomplete/Unclear ☐ Fit/Function ☐ Misread ☐ Marks/Chatter ☐ Drill Holes ☐ Misaligned/off center ☐ Turning Sequence ☐							
OTHER: ☐											



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID **PO30533**

Purchase Order Date 11/20/2015

PO Print Date 11/23/2015

Page Number 5 of 6

Order From :

SKYSERVICE
6120 MIDFIELD ROAD
MISSISSAUGA, ONTARIO L5P 1B1
CANADA

VC-SKY001

Ship To : DART AEROSPACE LTD

1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

Contact Name

Vendor Phone 905-678-5636

Ship To Contact

Ship To Phone

Ship Via:

Delivered

Ship Acct:

Buyer

Chantal Lavoie

Customer POID

Customer Tax #

10127-2607

Terms

Net 30

Currency

CAD

FOB

FCA - (Free Carrier)

Line Total: \$115.00

12	138661	D350-748-203 CROSSTUBE	11/23/2015	1.00	\$115.00	\$115.00
----	--------	---------------------------	------------	------	----------	----------

Yes

11/23/2015

SAME AS ABOVE

Line Total: \$115.00

13	138662	D350-748-203 CROSSTUBE	11/23/2015	1.00	\$115.00	\$115.00
----	--------	---------------------------	------------	------	----------	----------

Yes

11/23/2015

SAME AS ABOVE

Line Total: \$115.00

14	138714	D350-748-103 CROSSTUBE	11/23/2015	1.00	\$115.00	\$115.00
----	--------	---------------------------	------------	------	----------	----------

Yes

11/23/2015

SAME AS ABOVE

Note:

11/23/2015

8015-11-23



skyservice Work Order Traveler

Sky Service F.B.O. Inc.

DOT APP 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO26474	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: 30533
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON 13 CROSSTUBES AS PER PO30533

2 AFT CROSSTUBES, ITEM ID# D212-664-207 , WORK ORDERS ID# 136710, 138508

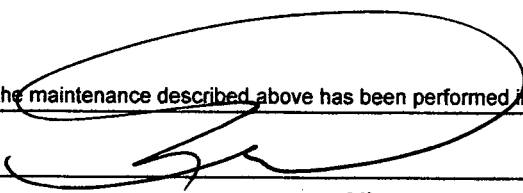
6 STAINLESS STEEL AFT CROSSTUBES, ITEM ID# D350-748-203 , WORK ORDERS ID# 138647, 138648, 138649, 138650, 138661, 138662

5 STAINLESS STEEL FWD CROSSTUBES, ITEM ID# D350-748-103 , WORK ORDERS ID# 137437, 137438, 138714, 137436, 137439

SP 1541-23

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M13 NO CRACK FOUND PEN. ZL-56, MPO13600, UV M-20141, CLEANER SKC-S MPO13923 , DEV. MPO11715						NOV 20 2015	 
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: NOV 20 2015
Name: RAFIK MELIKIAN		

QA Closed:

Date:

WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐Work Order: 138714Part No. D350-748-103

NCR No.

DISPOSITION

 Rework ☒
 Scrap ☐
 Use-as-is ☐
 Suspected Unapproved ☐

AGAINST DEPARTMENT/PROCESS

 Skid-tube ☐
 Machining ☐
 Thermoforming ☐
 Large Fab ☐

 Cross tube ☐
 Small Fab ☐
 Finishing ☐
 Composite ☐

 Water Jet ☐
 Prod. Eng. Coord. ☐
 Rec/Store/Packaging ☐
 Supplier ☐

 Engineering ☐
 Quality ☐
 Other ☐

Date:

15.11.26

Step #:

QTY Effective:

Description Work Order Deviation

AETK-1032 INSERTS BREAKING ON INSTALLATION

DAS
9
9-88

Disposition

BASED ON ENG TESTING IT WAS FOUND THAT INSTALLATION IS MORE RELIABLE IF INSTALLATION PRESSURE (AIR HOSE) IS REGULATED TO 50 PSI AND INSTALLATION HOLE IS REAMED TO Ø 0.290 IN ACCORDANCE MANUFACTURERS INSTRUCTIONS. OPEN PAR TO ADD NOTE TO STEP # 200 WHICH READS "LIMIT AIR PRESSURE TO 50PSI WHEN INSTALLING AETK-1032 INSERT AND ONLY EXPAND INSERT ONCE"

MRB (QSI042) Approval

15.11.26

Completed By

Lead hand / Supervisor
Approval VerificationQC / QA Coordinator
Approval

Root Cause

Environment ☐	No Re-verification ☐
Design ☐	Operator ☐
Doc/Data ☐	Offset/Setup ☐
Equip/Tooling ☐	Supplier ☐
Handling/Pre ☐	Training ☐
Material ☐	Use for Testing ☐
Internal Transport ☐	Poor Information ☐
Tribal Knowledge ☐	Rushing ☐
LOA ☐	Product Improvement ☐
Substation ☐	Process Improvement ☐
Past Expiry Date ☐	Manufacturing Process ☐
Misidentified ☐	Past Due ☐

 Pressure/Forced ☐
 Bending ☐
 Centre Not Concentric ☐
 Cracks ☐
 Crimp/Kink/Ripple/Wave ☐
 Cuffs ☐
 Crushing ☐
 Heat Treat ☐
 Wave/Twist in Tube ☐
 Marks/Chatter ☐

FAULT CATEGORY

 Temperature/Cure ☐
 Set-up ☐
 BOM/Route ☐
 Broken/Damage/Defect ☐
 Inspection Incomplete/Unqualified ☐
 Contamination ☐
 Countersink ☐
 Cut Too Short ☐
 Instructions Incomplete/Unclear ☐
 Drill Holes ☐

 Power Loss/Surge ☐
 Folio/Program ☐
 Grain ☐
 Weld ☐
 Wrong Stock Pulled ☐
 Out of Sequence ☐
 Off-set ☐
 Mis-labeled ☐
 Fit/Function ☐
 Misaligned/off center ☐

 Positioned Wrong ☐
 Outside Dimensions ☐
 Over/Under tolerance ☐
 Part Incorrect ☐
 Part Lost/Missing ☐
 Part Moved ☐
 Drawing ☐
 Finish ☐
 Misread ☐
 Turning Sequence ☐

OTHER:

DQA# _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☒

Work Order: _____	DISPOSITION Rework ☒ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS					
Part No. _____		Skid-tube ☐	Cross tube ☒	Water Jet ☐	Engineering ☐		
		Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐		
NCR No. _____		Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐		
	Large Fab ☐	Composite ☐	Supplier ☐				

Date : 16-01-19	Step #: 200	QTY Effective : ①	MRB (QSI042) Approval DAS 9 9-89 16-01-18
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Description Work Order Deviation	Disposition	
AETC-1032 inserts breaking on installation P.C. equipment, no air regulator on tool	had on work order to limit air pressure to 50 psi when installing AETC-1032 insert	Completed By DAS 10 9-89 16-01-19 Lead hand / Supervisor Approval Verification DAS 9 9-89 16-01-19 QC / QA Coordinator Approval DAS 9 9-89 16-01-19

Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☒ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☒ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : _____					